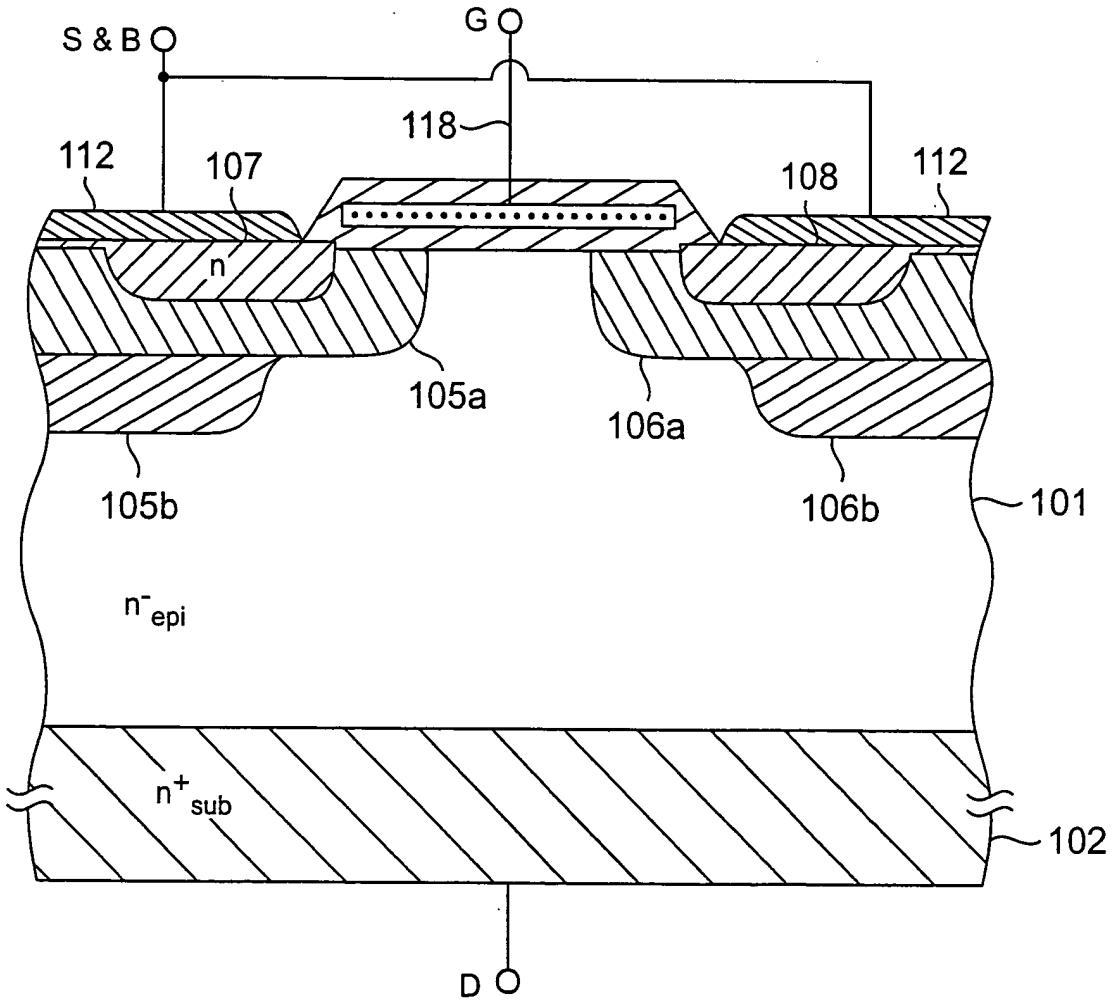
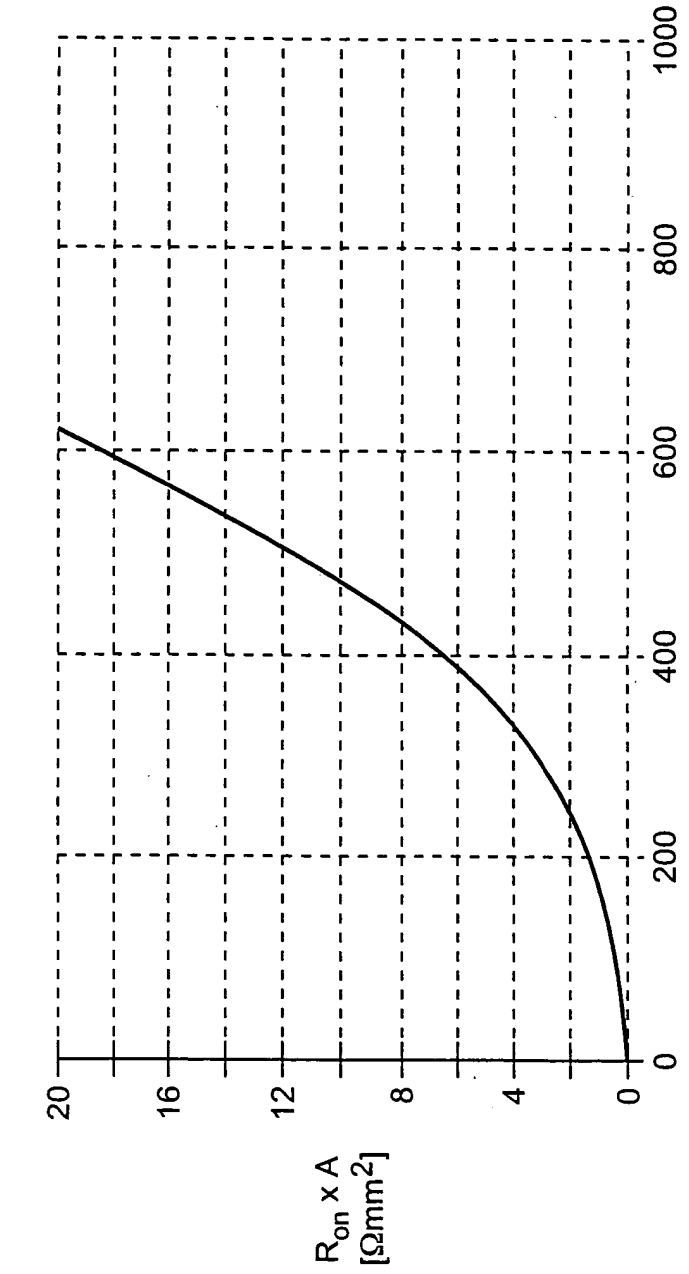


CONVENTIONAL MOSFET

FIG. 1



THE SPECIFIC ON-RESISTANCE OF A VERTICAL DMOS TRANSISTOR WITH THE DOPANT DISTRIBUTION OF FIG. 1

FIG. 2

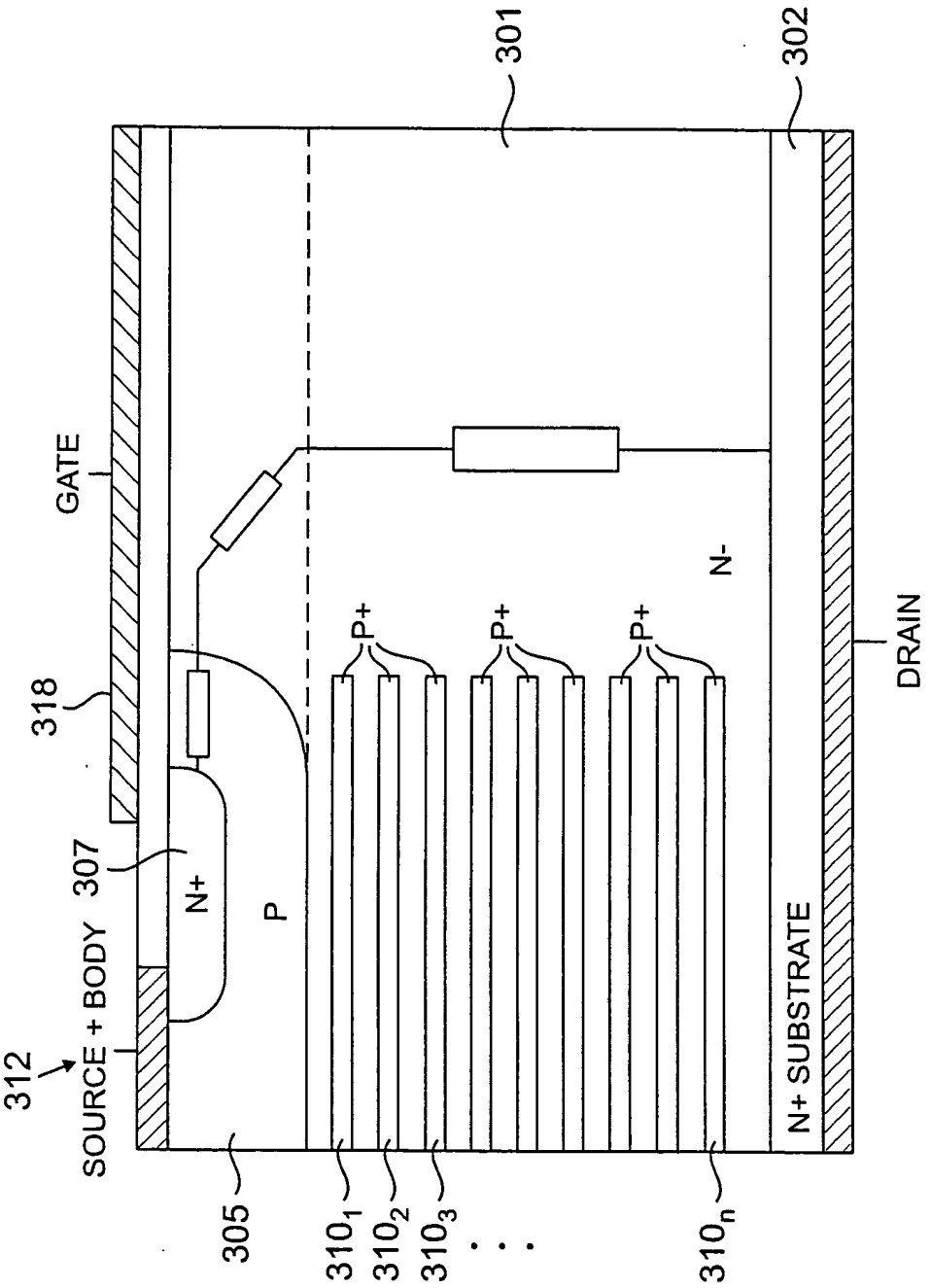

301
302
GATE
318
307
N+
P
P+
P+
P+
N-
DRAIN
312
SOURCE + BODY
N+ SUBSTRATE
305
310_1
310_2
310_3
310_n

FIG. 3

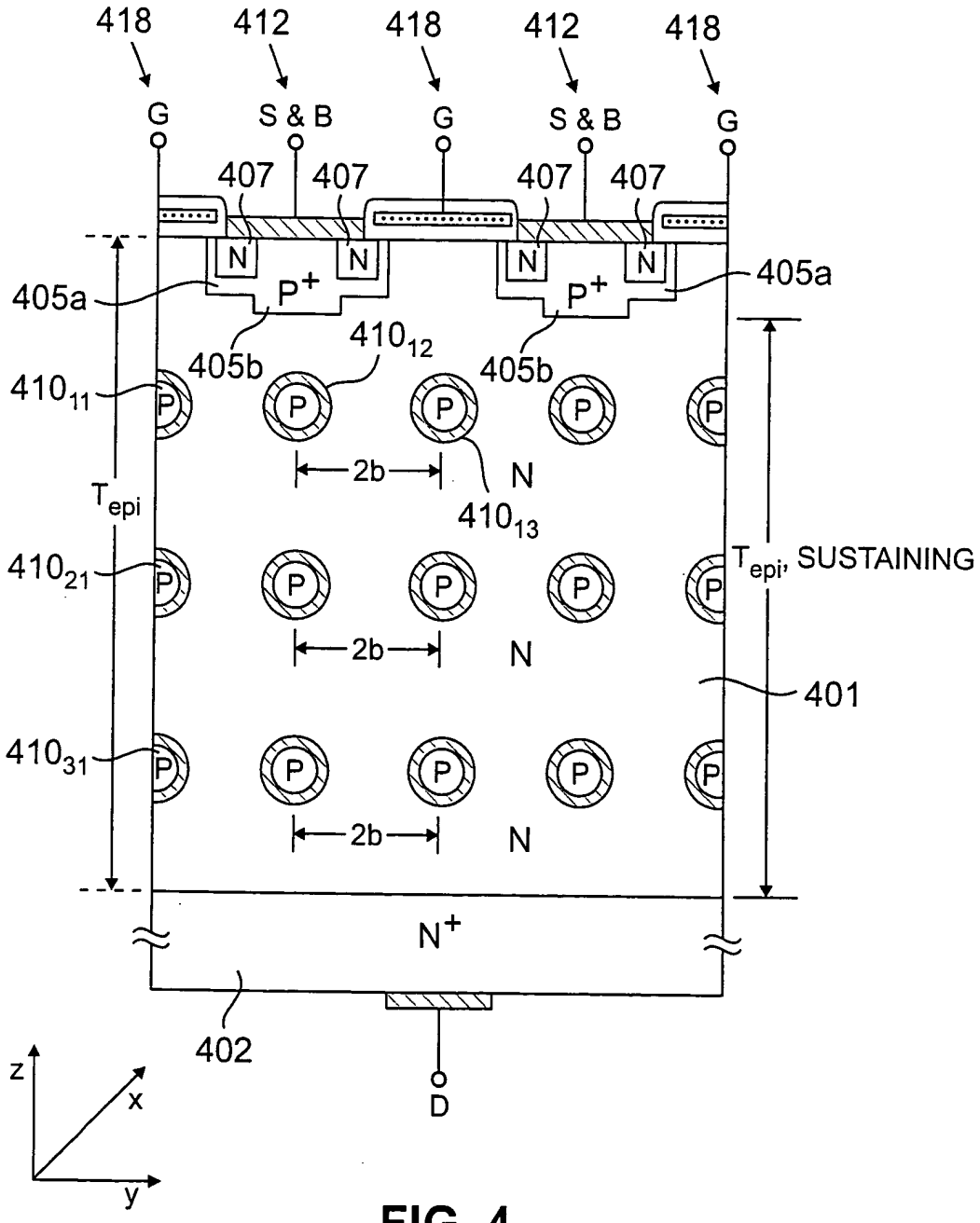

418
412
418
412
418
G
S & B
G
S & B
G
407
407
407
407
N
N
N
N
P+
P+
405a
405a
405b
405b
410$_{12}$
410$_{11}$
P
2b
N
410$_{13}$
T$_{epi}$
410$_{21}$
T$_{epi}$, SUSTAINING
401
410$_{31}$
N+
402
D
z
x
y

FIG. 4

STEP

1. EPITAXIAL DEPOSITION
2. FORM BARRIER LAYER
3. MASK AND ETCH THE TRENCH BARRIER LAYER
4. TRENCH ETCH

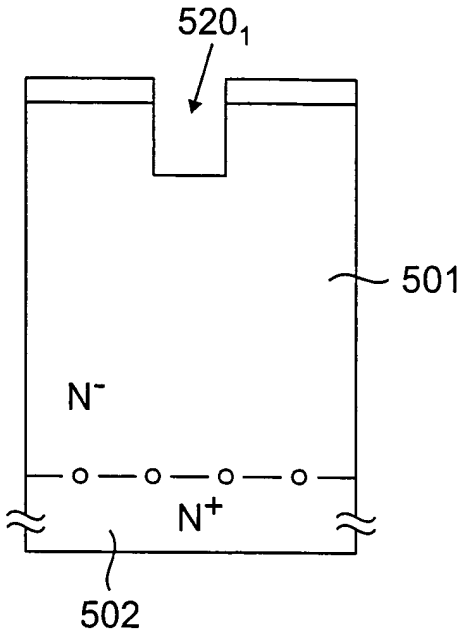


FIG. 5(a)

STEP

5. FORM A LAYER OF MATERIAL ON THE INSIDE OF TRENCH
6. ETCH LAYER FROM TRENCH BOTTOM

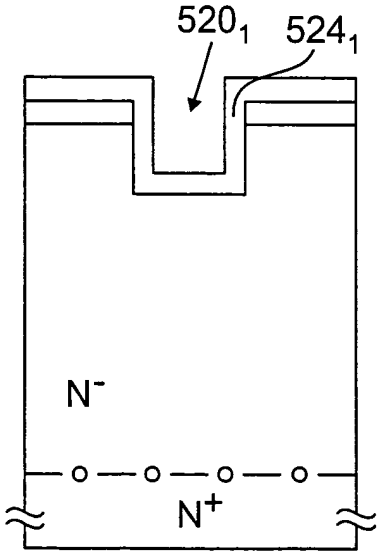


FIG. 5(b)

STEP

7. ETCH TRENCH

8. FORM A LAYER OF MATERIAL ON THE INSIDE OF THE TRENCH

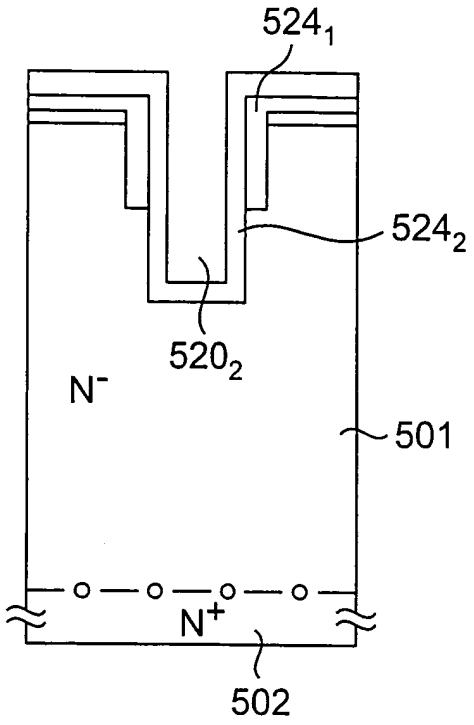


FIG. 5(c)

STEP

9. REPEAT THE STEPS OF ETCHING THE MATERIAL FROM THE BOTTOM OF THE TRENCH, ETCHING THE SILICON TO INCREASE THE DEPTH OF THE TRENCH, AND FORMING ADDITIONAL MATERIAL ON THE SIDEWALLS AND THE BOTTOM OF THE TRENCH FOR ALL BUT THE LAST LAYER OF ISLANDS

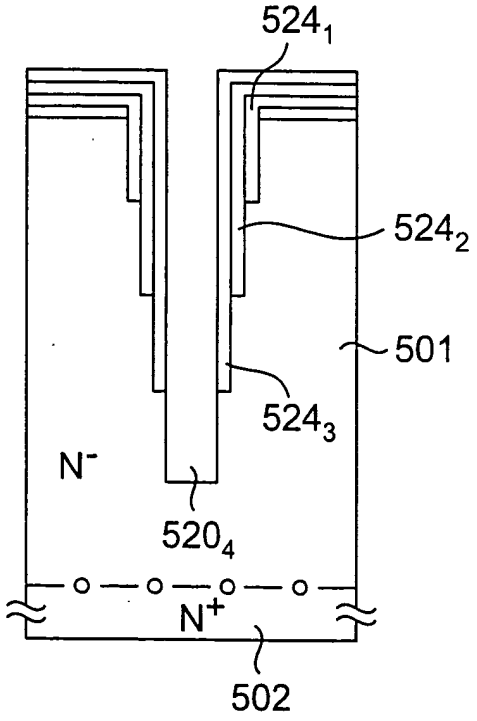


FIG. 5(d)

STEP

10. ETCH LAYER FROM TRENCH BOTTOM AND ETCH TRENCH
11. REMOVE ALL MATERIAL FROM TRENCH SIDEWALL
12. GROW OXIDE LAYER

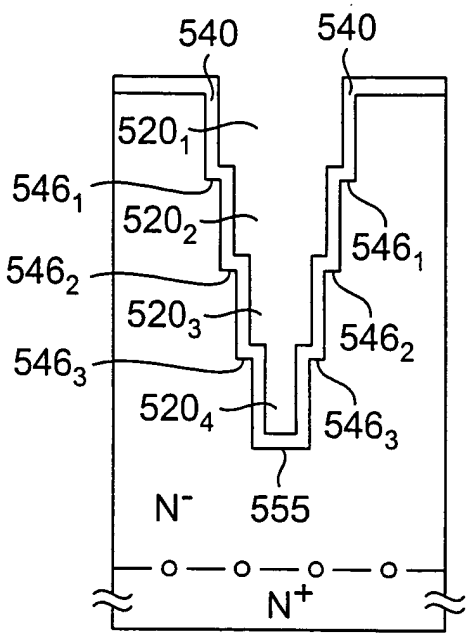


FIG. 5(e)

STEP

13. ION IMPLANTATION
14. DIFFUSION
15. FILL TRENCH
16. PLANARIZE THE WAFER

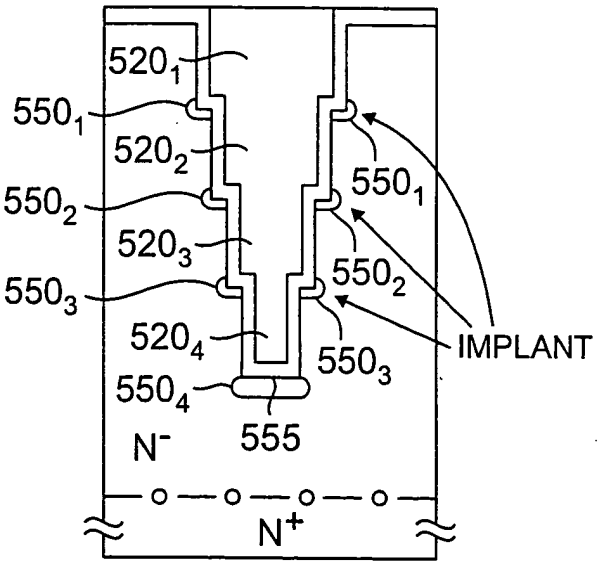


FIG. 5(f)

STEP

13. ION IMPLANTATION
14. DIFFUSION
15. FILL TRENCH
16. PLANARIZE THE WAFER

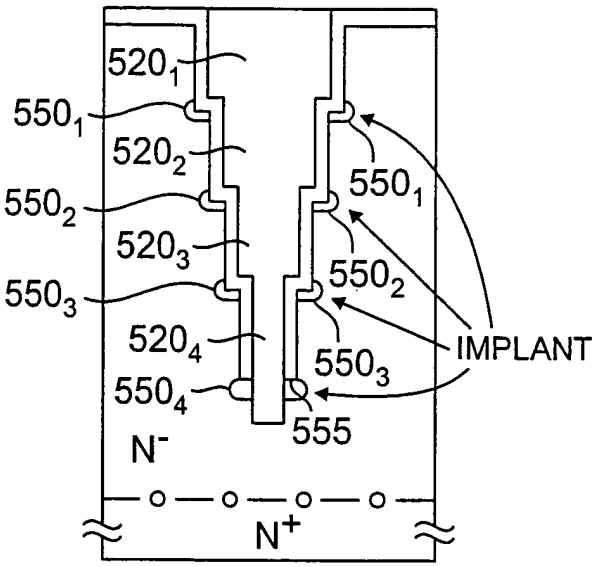


FIG. 5(g)